For the **COMMODORE 64** with disk drive.

MUSIC PROCESSOR™

Create, edit, record, play and compose your own musical arrangements.

An easy-to-play, fully-documented music program.

SIGHT & SOUND
Music Software Ink

We unleash the music in you.™

MUSIC PROCESSOR™

Instruction Manual

SIGHT & SOUND
Music Software, Inc.

THE MUSIC PROCESSOR™

By M. Peter Engelbrite

For Commodore 64 with disk drive

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TO LOAD THE MUSIC PROCESSOR

1. After powering up your computer, insert the program disk in the drive and type LOAD"*",8,1 and press RETURN. When "READY" appears type RUN and press RETURN.

Note: During loading, some disk drive noise is normal.

2. Following The Music Processor theme song, a Main Menu appears. Loading is finished.

Note: Be sure to leave the program disk in the drive. Periodically The Music Processor will go looking for various files on the disk.

3. If you have a joystick, this is a good time to plug it into Control Port #2 (the one toward the rear of the computer).

PERFORMANCE NOTE

As with any new program you probably can't wait to try out all the features of your Music Processor. Because The Music Processor is packed with so many neat features, you might decide to try only one or two in a sitting. Or, you might decide to sit until you've tried all the commands and features, regardless of time. No matter which way you go, be sure to refer to the index and this manual often.

Take note of the Menu on the screen. It lists not only song titles, but also the main modes of your Music Processor. You'd probably like to sample some of these and there are two ways of doing it:

1. The Quick, Experimental Method.

Hit the F7 function key on the right of the computer. Here you'll find brief explanations of the modes available in The Music Processor. You may choose which mode sounds interesting to you and "wing-it" on your own. Hit the RETURN key to return to the Main Menu. Hint: Be sure to check the index periodically which indicates where in this manual you'll find the help you'll need for various functions.

2. The Follow-Along Method.

In the next few pages, follow the steps indicated. You'll find step-by-step hints to help you touch lightly on some of The Music Processor features. If you'd like to delve deeper into any area, check the detailed command lists or the index for the help you need.

Note: Exit any of the following modes by pressing RUN/STOP.

TO PLAY A TUNE

The Music Processor has a whole array of pre-programmed songs. The list of songs appears on the Main Menu. To play one:

1. Choose one of the titles.

2. Press the letter key indicated.

3. The disk drive starts to turn and loads the song file.

4. When loading is finished, the song automatically begins to play.

5. When the song is finished The Music Processor returns to the Main Menu. Note: Anytime you'd like to stop a song before it's finished, simply press "Q" or RUN/STOP to quit. The Main Menu reappears on the screen.

Each of the songs is arranged especially for The Music Processor. Some songs even highlight some of the editing features you'll soon use to create not only great sounds but entertaining visuals.

For example:

Try BILL BAILEY. It has lyrics which allow you to sing-along. Also, graphics are included which correspond with music and lyrics.

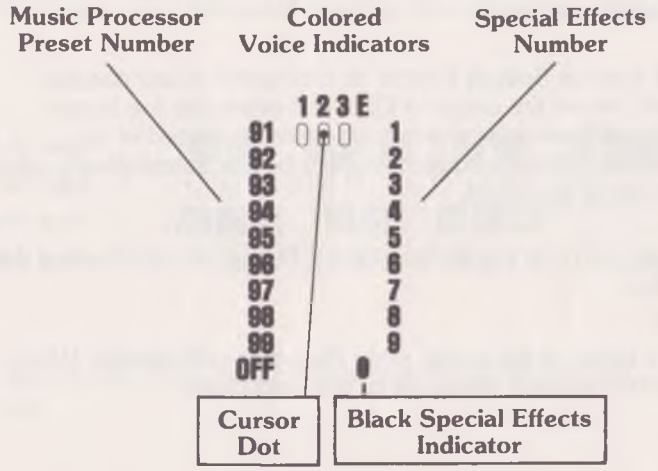
In the MEDLEY, background and border colors change to create interesting visual effects timed with the music.

In the song KITES, unusual visual effects are displayed in time with the music. Note: You can create effects like these using the MUSIC VIDEO KIT, a program which you can use in conjunction with The Music Processor. Inquire at your dealer or Sight & Sound Music Software, Inc.

While a song is playing, you can:

- Change Tempo (how fast the song plays) by pressing the number keys Ø through 9 — Ø is the slowest; 9 is the fastest. You can also make slight variations in Tempo by tapping several times on the + key to increase tempo; the - key to decrease.

- Use the joystick (or cursor controls) to change instrument sounds. Move the joystick (or press a cursor button) and a small display appears at the right of the screen.



- The **colored circles** correspond to each of the dancing colored notes.

- The **numbers** on the left indicate 9 of The Music Processor pre-programmed instruments or "presets". There are 99 available and you can choose which you like best. More on this on page 30.

- The **numbers** on the right are special effects.

- The **black circle** indicates which special effect you've chosen.

To use:

1. While a song is playing, move the white cursor dot to the left or right to one of the colored circles.

2. Move the circle up or down to the chosen instrument sound. Note: A little dot remains behind to indicate what instrument is still playing.

3. When ready, press the Fire Button and the new instrument starts to play on the corresponding colored note. Or in the case of the black circle, the chosen Special Effect is turned on.

To turn off Special Effects or the sound of any dancing note, move the circle to OFF and press the fire button. Note: When using the cursor controls instead of the joystick, the new sound or effect begins automatically when the circle is moved.

Also, you can toggle the Special Effects on or off using the E key.

Try some of the songs while changing instruments. When you've finished, move on to the next mode. . .

F1 - PIANO MODE.

In the Piano Mode you can:

- Play the computer keyboard like a piano.
- Sample the 99 presets built into The Music Processor.
- Play along with various pre-programmed accompaniment patterns.

Press the Function key F1 to enter the Piano Mode.

In this mode your computer keyboard becomes piano-like.

For your most convenient playing, use the upper two rows of keys.

Note: Sight & Sound Music Software, Inc. has available the Incredible Musical Keyboard. This attaches to your Commodore 64 console and turns it into a real piano-like instrument with black and white keys. For more information contact your dealer or Sight & Sound Music Software, Inc.

The Incredible Musical Keyboard

This mode lets you sample all of the 99 preset Music Processor sounds. Simply press F1 to advance your selection — watch the indicator next to INSTR. Press F3 to go backward.

Selecting an **octave** sets your keyboard to a certain high or low sounding range. Your Music Processor has octaves from Ø to 7. Choose one using the F5 or F7 keys. Play any of the music keys to hear the difference as you change.

PLAY A SONG

Once you've selected an instrument and octave, try playing the following. It's the old folk round "Are You Sleeping". Note: Use version A if you are playing the computer keys, version B if you're playing on the INCREDIBLE MUSICAL KEYBOARD.

Ⓐ	TYUT	TYUT	UIO	UIO
	OPOIUT	OPOIUT	TWT	TWT
Ⓑ	GABG	GABG	BCD	BCD
	DEDCBG	DEDCBG	GDG	GDG

Try to play by ear some of the songs you might be familiar with. Try different sounds and octave ranges.

To exit Piano Mode, press RUN/STOP.

IF YOU KNOW HOW TO PLAY. . . TRY SOMETHING DARING. . .

While in the Piano Mode, choose instrument 11 or 18, octave 4. Press the ← (left arrow) key in the upper left of the keyboard. This starts a rhythm accompaniment pattern with which you can play along and improvise. Press (left arrow) again to stop the pattern.

Playing hint: The pre-programmed pattern is a shuffle and uses a "blues" progression in the key of C. Listen closely and play the top row of letter keys (Q W E R, etc.). Start with the I, P, and @ and expand to the others when you feel comfortable. Note: Other accompaniments are on The Music Processor disk and are discussed later. Also, you'll learn how to create your own accompaniments.

Press RUN/STOP to exit Piano Mode.

F2 RECORD

Here is just a small sample of how The Music Processor is your own in-home recording studio.

1. Press F2 to enter Record Mode.

2. When you feel ready, play the same song you did in Piano Mode. Note: If you'd like to start over, simply press RUN/STOP. Wait for the Menu, then press the F2 key again.

3. When finished press RUN/STOP to return to the Menu.

4. Press F4 to play back your recording.

More recording techniques are discussed later.

F3 JUKEBOX

Press F3 and your Music Processor loads and plays each song on the Menu, one right after another.

To exit Jukebox Mode, press Q or RUN/STOP.

Note: Once you start programming your own songs, refer to the Jukebox command discussed on page 24. There you'll learn how to create your own song disks and have the Jukebox play them in exactly the order you want — just like a real jukebox.

F4 PLAY

Press F4 to play the song currently in memory. If there is none the menu reappears. To stop the Play mode press Q or RUN/STOP.

To have a song repeat in the Play mode simply press the **R** key during play. This causes the song to play continually until you stop it with the Q key. Remember, you can change tempo and use the joystick to change instruments and special effects.

F5 EDIT MODE

In this mode you'll need to store your work files on disk.

Note: NEVER TRY TO STORE FILES ON YOUR MUSIC PROCESSOR PROGRAM DISK. ALWAYS USE A FORMATTED WORK DISK.

FORMATTING A WORK DISK

The Music Processor contains several built in disk commands. For formatting:

1. Press F5 to enter EDIT Mode (READY should show).

2. Remove program disk.

3. Insert a blank disk.

4. Type DISK NØ:WORK DISK,WD

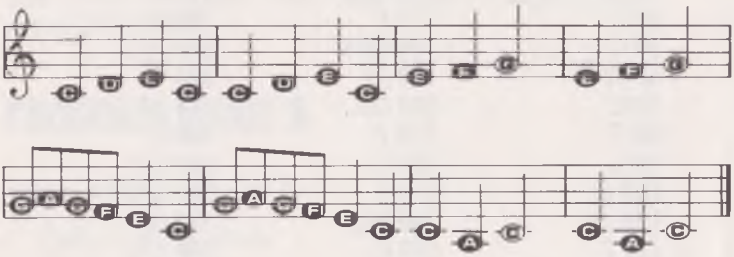
5. Press RETURN. Formatting takes approximately 1 1/2 minutes and erases any previous material on the disk.

6. When formatting is completed, continue below.

The power of the Music Processor really comes alive with the versatility of editing and music commands. A great way to learn how these commands and functions operate is to USE them.

Following is a song example which you can type in and manipulate to **sample** some of the functions of The Music Processor.

ARE YOU SLEEPING



This melody can be turned into a "round" and here's how to do it.

Enter the EDIT Mode by pressing the F5 key (READY should show).

PROGRAM VOICE 1

1. Type NEW. Press RETURN. This clears memory.

2. Type AUTO. Press RETURN. Since your Music Processor reads arrangements line by line (just like a BASIC program), AUTO saves you unnecessary typing by automatically numbering the lines of your arrangement. Note: Each line number increases by 10 to leave room for command lines you may want to insert later.

3. Type in the notes as follows (hit RETURN after each line). Note: If you make a mistake, exit the AUTO mode by pressing RETURN twice. Correct your mistake using the CRSR and INST/DEL keys.

When you're finished correcting, move the cursor below READY on the screen. Retype AUTO. Press RETURN and The Music Processor displays the next available line number for you.

Helpful hint: You'll find a complete explanation of the music code on page 36.

Ready? Type.

```
10 /1
20 C4Q
30 D
40 E
50 C
60 /2
70 C
80 D
90 E
100 C
110 /3
120 E
130 F
140 GH
150 /4
160 EQ
170 F
180 GH
190 /5
200 GE
210 A
220 G
230 F
240 EQ
250 C
260 /6
270 GE
280 A
290 G
300 F
310 EQ
320 C
330 /7
340 C
350 G3
360 C4H
370 /8
380 CQ
390 G3
400 C4H
```

This completes Voice 1 of your 3-part arrangement. Press RETURN twice to exit AUTO mode.

To play what you've just entered, type P and hit RETURN.

To continue developing a 3-part arrangement, you should store this part on disk.

1. Insert your work disk in the drive.

2. Type S SLEEP1. Press RETURN.

PROGRAM VOICE 2

Since this is a "round", Voice 2 can be easily created by making two changes to Voice 1. Voice 1 is still in memory. Be sure to press RETURN after each line.

Type two new lines.

```
5 RW
6 R
```

This adds two new lines right at the beginning of Voice 2.

To see that these lines have been added, type L. Press RETURN and hold the CTRL key. As your program scrolls, you can see lines 5 and 6 are at the beginning of the list.

Save Voice 2 on your work disk. Type S SLEEP2 and press RETURN.

PROGRAM VOICE 3

This is similar to Voice 2.

1. Type two new lines.

```
7 RW
8 R
```

2. Type S SLEEP3 and press RETURN. This saves the final file to disk.

PUTTING IT ALL TOGETHER

Now comes the exciting part. The Music Processor can merge your three files into one complete 3-voice arrangement.

1. Type

   MERGE SLEEP1,SLEEP2,SLEEP3

2. Press RETURN

When the disk drive stops, press P and hit RETURN. If you've done everything right, you should hear your completed arrangement. If something is wrong, be sure to check your typing and edit using the CRSR and INST/DEL keys.

For safekeeping, store your merged arrangement on your work disk.

Type S ARE YOU SLEEPING and press RETURN.

MORE TRICKS IN THE EDITING MODE

Now that you've got a completed arrangement, you can make some neat changes. Note: While making changes or experimenting with the following tricks, if you find you'd like to start fresh:

1. Type NEW and hit RETURN.

2. Then, type LO ARE YOU SLEEPING and press RETURN.

This reloads your completed arrangement from disk as it was before changes.

SOUND CHANGES

1. Type these three new lines. Hint: Note the difference between the letter "I" and the number "1".

```
5 I1,5
6 I2,11
7 I3,56
```

This changes the instrument sounds for the three voices.

2. Type P and press RETURN to hear the new sounds.

TO CHANGE BACKGROUND AND BORDER COLORS

The following commands control the background and border colors for your arrangement:

PDØ2Ø controls the border

PDØ21 controls the background

The colors are indicated by a number or letter shown on the following chart:

Ø BLACK	8 ORANGE
1 WHITE	9 BROWN
2 RED	A Light RED
3 CYAN	B GRAY 1
4 PURPLE	C GRAY 2
5 GREEN	D Light GREEN
6 BLUE	E Light BLUE
7 YELLOW	F GRAY 3

You can take care of both background and color with one command and two color indicators. This is shown in the following lines, which you can add to your arrangement. Be sure to press RETURN after each line.

Type:

```
121 PDØ2Ø,6,7
251 PDØ2Ø,7,D
431 PDØ2Ø,8,3
591 PDØ2Ø,9,F
751 PDØ2Ø,4,7
```

Hit RETURN after each line. The Music Processor automatically inserts each in its proper place in your song program. Type P and press RETURN to see the results of the new lines. Try various color schemes by changing the color indicators. Note: If you choose a background color the same as one of the note colors, the note becomes invisible.

LYRICS

You can add lyrics to your song.

The command L for lyric follows a line number. Type in these lines. Press RETURN after each.

```
 11 L ARE YOU SLEEPING?
 61 L ARE YOU SLEEPING?
111 L BROTHER JOHN
171 L BROTHER JOHN
231 L MORNING BELLS ARE RINGING
321 L MORNING BELLS ARE RINGING
411 L DING DONG DING
501 L DING DONG DING
```

When you're finished typing, press P and RETURN and the song plays while displaying the lyrics at the bottom of the screen.

FOLLOW THE BOUNCING BALL

To highlight your lyrics in time with the music, type exclamation marks (shifted number 1) at the end of certain lines.

Example: 20 C4Q,RW,RW!

This adds a "bouncing ball effect" for sing-along fun.

Here are the line numbers in which to add exclamation marks.

Use the CRSR controls and **be sure to press RETURN** after each line.

20	260	480
30	280	530
40	290	550
70	300	570
80	350	
90	370	
130	380	
150	390	
190	440	
210	460	

When you're through typing, type P and press RETURN.

AND THERE'S MORE

Now that you've got a completed arrangement you can use the joystick to change instrument sounds, special effects, and change tempo just as you did on page 5. Also, try pressing R to have your arrangement play continually (press Q to stop it). Note: Each time the arrangement plays, the joystick display is reset to its starting position.

F6 REPEAT

This mode is just like the Play mode except the song in memory plays over and over continually.

To stop the song, press **Q** or RUN/STOP.

F7 EXPLANATION

Use this mode for a quick reference. It explains the various modes and it's right at your finger tips.

F8 RANDOM

This mode lets the computer go off and create. It plays random note patterns generated by formulas in The Music Processor.

Because it plays such a wide variety of notes, it's great for sampling all The Music Processor presets with joystick. See how to set up the display by refering to PRESETS (PR) pg. 30. Also refer to RANDOM (RA) pg. 30.

To stop Random, press **Q** or RUN/STOP.

EDITOR COMMANDS

The Music Processor editor is much like the editor in Commodore 64 BASIC, only much more powerful. The commands described in this chapter allow you to load tunes into the work area, examine them, alter them, and play them. The work area is the temporary memory (RAM) of your computer. You may make alterations to tunes in the work area, but these changes are not permanent unless you 'SAVE' your tune to a disk file.

Once you've used The Music Processor for a while, you'll probably want to get into the editor mode right away. The fastest way to do this is to press the F5 function key during the power-up song. When the song stops you'll be in the Edit mode.

Each line of your tune has a line number. See the chapter on music notation and Music Commands to learn what you put in these lines. This chapter just explains how to create new tunes, or alter existing ones. Line numbers may range from 1 to 65534 inclusive.

You may insert a line by typing the number, optionally followed by any number of spaces, followed by the information you wish to insert. To erase a line, type the line number and hit RETURN.

While a tune is playing, you may change the tempo (speed) by pressing Ø through 9 (Ø is very slow, 9 is very fast, 4 is normal). You may go to trace mode by pressing T, single step mode by pressing S, repeat mode by pressing R, or back to normal play mode by pressing P. See the PLAY, REPEAT, STEP, and TRACE commands for more information on these modes.

If you press the Return key during PLAY The Music Processor stops and lets you enter a music command (not an editor command). When you press Return again, The Music Processor plays that command, and continues on. Pressing the Q or RUN/STOP key during play causes The Music Processor to stop playing, and return to normal editor mode.

The following commands are available with The Music Processor editor and appear here in alphabetical order. You may want to refer to the index from time to time to find the exact command you need. Unless otherwise noted, the parameters may follow immediately after the command, or may be separated by space(s).

Note: Each command has a short form to save you typing. It appears in the parentheses following the command.

APPEND (AP) It appends a file to the end of the tune currently in the work area. Follow this command by at least one space, and the file name.

Examples:

AP TMP
APPEND MEASURE 2
AP XXX

AUTO (A) This command allows you to enter your tune without having to type line numbers. To enter auto number mode type AUTO and press RETURN. The Music Processor then responds with a number. This number is 10, unless you already have a tune in the work area, in which case it will be the number of the last line in your tune plus 10. You may now enter the lines of your tune and The Music Processor automatically numbers them. To exit the auto number mode (which you must do to use any other editor commands), just enter a blank line (press RETURN at the beginning of a line).

You may specify which line to start numbering on by following the AUTO command with the starting line number.

Examples:

AUTO
A
AUTO11Ø
A 1ØØ1

BYE This returns you to the Commodore 64 BASIC mode, and exits The Music Processor entirely (erasing The Music Processor from memory).

Example:

BYE

DELETE (DEL) Follow this by two line numbers, separated by a comma. This deletes all lines between, and including, the two line numbers.

If you leave off the last number, it deletes to the end of the tune. If you leave off the first number, it deletes from the beginning of the tune.

Examples:

DEL 40,200
DEL ,140
DEL 1520,

DIRectory (DI) This displays the current disk directory, and does not disturb any tune you may have in The Music Processor work area. You may optionally follow the DIR command with at least one space and a filename. The filename may include the normal Commodore wildcard characters (* and ?).

Examples:

DI
DIR MIN*
DIR BACH.*
DIR MUSIC PROCESSOR
DI MUSI*

DISK (DIS) This command opens the disk command channel, sends the command that you specify, and then closes the command channel. Put at least one space before your disk command. It does not disturb any tune you may have in The Music Processor work area.

Examples:

DISK SØ:TEMP.FILE (delete a file)
DISK RØ:NEWFILE=OLDFILE (rename a file)
DISK CØ:COPY=ORIG (copy a file on the same disk)
DISK NØ:DEMO.DISK,ØØ (format: erase a disk)
DIS I (initialize disk drive)
DIS V (verify: cleanup a disk)

FIND (F) Follow this by a "/", then print the text you wish to find, followed by another "/". In order to find text in which the "/" is included, you may substitute any character for the "/" as delimiters for your text. FIND then searches through your entire tune, finds the first occurrence of your text, stops, and prints out that line. You may then go on to find the next occurrence of that same text by typing FIND, followed directly by a RETURN. This process may be repeated over and over as you wish, until you come to the end of your tune. Also, FIND does not become confused by any changes you make to your tune during this process (unless you renumber).

Examples:

F/P CØØØ,FF/
F"/ REPEAT MEASURE"
FIND /2/

FAST FORWARD (F) Press the F key during play of a song, and the tempo noticeably increases. This saves you time when editing by allowing you to move quickly to any part of a song. To stop Fast Forward press the F key again and your song returns to its original tempo.

Note: Fast Forward is cancelled by any Tempo commands in the music code. If you are using Fast Forward, and the music slows down, press the F key again to resume Fast Forward.

FREE (FR) This tells you how many free bytes are left for your music data.

Examples:

FR
FREE

INSERT (I) Follow this by two numbers, separated by a comma. Example: I1Ø0,5. In this example, five line numbers would be inserted in front of line number 1Ø0. This command does not actually insert blank lines, but renumbers the lines that follow. This creates a gap in the line number editing system which allows you to insert new tune lines. If the second number is omitted, it defaults to inserting 1Ø0 lines.

Examples:

I1Ø0,5
I20,5Ø0Ø
I935

JUKEBOX (J) This command allows you to play a selection of tunes, one after another. Follow this command with at least one space, and the name of the jukebox file. Examples:

J JUKEBOX.OLDIES
J JUKE.ALL
J SPECIAL.JUKE

A jukebox file is a disk file containing a list of editor commands. These commands are normally the "PLAY filename" type commands, but other editor commands may be used. To set up a Jukebox file:

To set up a Jukebox file:

1. Type AUTO and RETURN.

2. For each line type PLAY Songname and hit RETURN. The Songnames should be in exactly the order you want them to play.

3. When finished save your new file to disk.

Type S JUKE.FileName
The period assures this file only shows in the directory and not the Main Menu.

Note: The F3 function on the Main Menu plays a jukebox file named JUKE.BOX. You may load this file from the program disk, and examine it.

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KEYBOARD (K) This allows you to re-configure the keyboard in PIANO & RECORD modes. Create a "tune" where on each line, you have the key to be modified, followed by the letter of the note, followed by the octave (start in octave 0), followed by the accidental (# , f, N, or nothing).

```
10 QC2
20 WD2
30 ED2
```

Note: The INST/DEL key and CLR/HOME key produce no symbol of their own. To modify these use:

[for the INST/DEL key (shifted :)
? for the CLR/HOME key

Follow these symbols by the note name and octave.

Examples:

```
10 [B3
20 ?C4
```

The order of the lines is not important, but the order within each line is. Save this to your work disk under a filename starting with K. Then use the KEYBOARD command with the filename. Included on the disk are K.NORMAL which is the normal keyboard, K.CHROM which is a chromatic scale, and K.ACHROM which is a diatonic scale.

Examples:

```
SAVE K.SMALL
KEYBOARD K.SMALL
```

LIST (L) The LIST command, followed by a single line number, prints that line, and that line only, on the screen. The LIST command, followed by two line numbers separated by a comma, lists those two lines, and all the lines between them, in order. The LIST command, followed by a comma and then a line number, lists all lines from the beginning of the tune up to, and including, that number. The LIST command, followed by a line number and then a comma, lists all the lines to the end of your tune, starting at and including, that number. The LIST command followed by RETURN, lists the entire tune. The tune listing may be stopped with the RUN/STOP key. The listing can be slowed by holding the CTRL key.

You may "list" your tune to your printer by typing PLI followed by RETURN.

Examples:

L
L10
L10,40
L ,40
L 40,
LIST

LOAD (LO) Follow this command by the file name of your tune. This loads your tune into the work area for editing or playing. It also automatically renumbers lines to your tune by tens, starting with ten. (There must be at least one space before the file name). If you include a colon or comma in your file name, then The Music Processor reverts to the normal C-64 format, allowing you to use different file types.

Examples:

LO INST
LOAD MINUET IN D
LO MIN*

MENU (M) This returns The Music Processor to Menu mode. Menu mode presents a tune list of the disk presently in the drive. It gives each tune a letter. You may play that tune by pressing that letter. You also have the following functions:

f1 : Piano mode
f2 : Record mode
f3 : Jukebox (uses file JUKE.BOX)
f4 : Play last tune
f5 : Edit mode (normal)
f6 : Play last tune in repeat mode
f7 : Explanation (uses file EXPLANATION.TXT)
f8 : Random mode

Pressing any other key while in the Menu mode will re-do the menu.

Note: Only those files that are of type USR, and do not have a period(.) somewhere in their name, are considered tunes, and appear in the menu.

Examples:

M
MENU

MERGE (MER) MERGE allows you to merge up to three separate melodic lines into one three-part harmony. The voices should be entered separately, as if they were all voice number 1. SAVE each to a separate file. Only one of them should have music commands other than notes. The Merge command takes these three files, merges them into one, automatically calculating the proper sequencing, and leaves them in memory for editing, playing, or saving. Follow the MERGE command with the three file names (or two if you want), separated by commas. The first one is voice #1, the second is voice #2, and the third is voice #3. If you want certain voices to be silent, then omit the file name for that voice, leaving just the commas (useful for creating accompaniment files).

Examples:

MER FILE1,FILE2,FILE3
MERGE ,ACC.X1,ACC.X2
MER ,ACC.TMP

NEW This command erases your tune from the work area.

Example:

NEW

PIANO (PI) PI lets you play the keyboard like a piano. While in this mode, press RETURN to enter a music command. Use f5&f7 to change the instrument. Use f1&f3 to change the octave. Press RUN/STOP to exit this mode. Press ← left arrow (not CRSR) to turn the accompaniment on and off.

You can choose a different accompaniment by following the PIANO command with the file name of the accompaniment file. If you don't give any file name, then PIANO will use whatever accompaniment has already been loaded. The default accompaniment is named ACC.NORMAL.

Examples:

PIANO
PI ACC.NORMAL
PI ACC.DISCO
PIANO X

Accompaniment files on The Music Processor disk are:

ACC.NORMAL	ACC.ROCK & ROLL
ACC.DISCO	ACC.SAMBA
ACC.ROCK	ACC.REGGAE

ACC.3/4
ACC.4/4
} Metronome files

See page 75 for chord progressions used in The Music Processor Accompaniment files.

CREATING ACCOMPANIMENT FILES

The accompaniment file is a normal tune file, except for the following:

The file starts with a "header" of setup commands, these can be anything from nothing at all to modifying several instruments and creating special effects. This section is played whenever the accompaniment is turned on (with the left arrow key). The line after this section should be a / (measure) command. This separates the header from the body. The body of the accompaniment consists of a series of notes using only voices 2 and 3, and possible music commands. This body is repeated continuously until stopped by the left arrow key. There is a restriction on this section in that a note using voice 3 cannot appear on a line by itself without a voice 2 (no ,,C4#). You can use the MERGE command to create this file.

```
10 M19,80,09,09,0,0
20 I2,19
30 I3,19
40/
50 ,C20,C6Q
60 ,C
70 ,C
80 ,C
```

Helpful hint: Load and LIST the Sample ACC. files on The Music Processor Disk. Examine them for help and hints in programing.

PLAY (P) This plays your tune. If you type PLAY and press RETURN, The Music Processor plays the tune currently in the work area. If you follow PLAY with a line number, The Music Processor starts playing at that line number. If you follow PLAY with at least one space, and a filename, The Music Processor loads that tune and plays it.

Examples:

```
P MAPLE
PLAY
P MIN*
PLAY200
P 1000
```

PLIST (PLI) Works exactly like the LIST command, except the listing is sent to the printer (device 4, secondary address = Ø), instead of the screen.

```
PLI
PLI 4Ø,1ØØØ
PLIST  5Ø
PLI  ,2ØØ
PLI  145Ø,
```

PRESETS (PR) This allows you to re-define the presets selected by the joystick during playback. They are entered one at a time, with a RETURN after each. Press RETURN alone if you don't wish to enter all nine.

Example:

PR
The program prompts.
PRESET #1 ?
Enter a number and press RETURN.

Note: The PR when used as a Music Command in your song data as described on page 44, cancels the PR commands described above. To reverse this for any song, simply delete the PR data lines in the song.

Be sure to refer to the PR command described on page 44 as a Music Command for additional information.

RANDOM (RA) Random mode randomly generates notes, and plays them. It normally uses eighth notes, but if you follow the command with W, H, Q, E, S, or T then it uses the chosen duration:

RA E

RANDOM chooses its notes from the keyboard configuration data (see KEYBOARD).

Press the fire button on your joystick, or press a cursor key, and change sounds and special effects during Random.

RECORD (REC) Lets you enter music as in PIANO mode, only records it as a Music Processor tune in memory. It also determines whether to put rests between your notes. It does not record rests beyond a dotted whole rest. It does not start recording until your first note. If you press RETURN it records the command you enter. Pressing f5 & f7 does not record the instrument change. RECORD first clears memory before entering. After entering your tune, press the space bar on the next beat to define the duration of the last note, and to add a rest at the end of your tune.

You can also load an ACC. (accompaniment) file to record with. Simply type REC followed by ACC. file name.

RENUMBER (REN) This command, followed by a RETURN, renumbers your tune by tens, starting at 1Ø. If the RENUMBER command is followed by a number, it renumbers your tune in intervals of that number, starting at that number.

Examples:

RENUMBER
RE
RE1Ø
RE 1ØØ
RE17

REPEAT (R) Functions exactly the same as PLAY, only the tune repeats until stopped with the Q key.

Examples:

R SUMMERTIME
R MINUETE IN D
R

SAVE (S) This command saves the contents of the work area to disk. The SAVE command is followed by the file name of your tune. (There must be at least one space before the file name). The Music Processor automatically erases any pre-existing file with that file name. Also, if you have a colon or comma in your file name, then you may use the normal C-64 file name syntax (this is useful if you want to create files with a different file type).

Examples:

S TEMP.1
SAVE ROW ROW ROW
SAVE
S Ø:SPECIAL,P,W

Note: Line numbers from your music data are not saved to disk. Therefore, when you load a file from disk, all lines are renumbered in increments of 10.

The SAVE function has another handy feature. To quickly input parts of your song that repeat, use the format SAVE filename, line number, line number. All the data between and including the two line numbers is saved to your work disk. Then, use the APPEND function to add the new file to the end of the data in the computer work space.

STEP (ST) The Step mode is a very powerful feature of The Music Processor. Learn to use it and work with it carefully to find and edit exactly the data you want in your arrangements. It's also a super mode to use when inputting a new arrangement.

The Step mode functions the same as PLAY, only starts out in single step mode. Single step mode allows you to "play" your tune one line at a time. Press the space bar to advance to the next line. It also displays the line being played at the bottom of the screen where the lyrics normally go.

Examples:

ST BILL BAILEY
STEP AMERICA
ST
STEP 23Ø

While in Step mode you can use the editing features by pressing the following keys:

! adds an exclamation mark to the end of the line.

↑ (up arrow next to RESTORE key) backs up to the previous line.

G stops the play of a song , lets you enter a line number to "GO TO", then continues from that line number (this command also works in play mode).

L inserts a line by renumbering the following lines (by adding 1Ø) allowing you to enter a line. Pressing RETURN alone creates a ; line (comment).

I generates a note and inserts it (similar to "L").

D deletes the current line (but does not renumber the following lines).

M allows you to modify the current line.

1, 2, or **3** selects which voice to use in the joystick editing.

#, F or **N** changes the accidental of the note.

*, =, or - changes the legatto, staccatto, tie of the note.

. turns the note into a dotted note.

R turns the note into a rest.

C clears #, F, N, *,–, =, R and . for that voice, also ! for the line.

, turns the selected note on and off (as in A3Q,,B4E vs. A3Q,D3E,B4E).

P returns to normal play mode.

T returns to trace mode.

Q quits and returns to normal edit mode or Main Menu.

(RETURN) is the same as pressing the joystick button, and is used to append new notes to the end of the tune.

The CRSR keys and the joystick change the pitch (up and down) and the duration (left and right) of the selected note. Pressing the Space Bar moves on to the next note.

If you step past the end of the tune, you may append notes using the joystick (or the other commands) to the end of your tune, numbering automatically by 10's. If you use the STEP command with no tune in memory (such as after the NEW command), the STEP command starts numbering at 10.

If you wish to add to the end of an existing tune, type STEP 65000 (or any lower number that is larger than the last line number of your tune).

While using L, I, M, or G commands that stop and allow you to enter a line, you may use the left CRSR, the right CRSR, the INST, the CLR, and the DEL keys to edit the line or command you are working on.

TRACE The short form is **(T)**. Functions exactly the same as PLAY, only the tune starts out in trace mode. Trace Mode plays your tune as normal and the data lines appear at the bottom of the screen.

Examples:

```
T SUMMER*
T MINUET IN ?
TRACE
T 150
```

MUSIC MODIFIERS & COMMANDS

MUSIC MODIFIERS

The Music Modifiers are pitch names, duration, octave numbers, and other symbols which The Music Processor uses to play the notes of your song.

If you know something about music and how to read it, these music commands will be a breeze to use.

If you'd like to learn about reading music, refer to page 50. Here you'll find a brief reference guide to music symbols and their corresponding music modifiers. Also, be sure to ask your dealer for music tutorial software produced by Sight & Sound Music Software, Inc.

MUSIC COMMANDS

The Music Commands allow you to change key, change the instrument sounds, change tempo, change volume, display lyrics, and perform special effects. These commands are entered as data lines, one command per line. The values you give the commands may be separated by spaces.

MODIFIERS

W : Whole Note

H : Half Note

Q : Quarter Note

E : Eighth Note

S : Sixteenth Note

T : Thirty-second Note

• : Dotted Notes (Increases duration by 1/2)

— : Tie

: Sharp

F : Flat

N : Natural

* : Staccato

= : Lagato

Ø, 1, 2, 3, 4, 5, 6, 7 : Octave

Examples:

B3Q*,D#4E,G2S

Voice 1: B, octave 3, quarter note, staccato
Voice 2: D, sharp, octave 4, eighth note
Voice 3: G, octave 2, sixteenth note

,RQ,AW5N

Voice 1: Silent
Voice 2: Rest, quarter
Voice 3: A, whole note, octave 5, natural

1Ø B3Q—,D4Q.
2Ø B3H , G4Q.

Voice 1: B, octave 3, quarter note in line 1Ø tied to a B, octave 3, half note in line 2Ø.
Voice 2: D, octave 4, quarter note with a dot in line 1Ø. G, octave 4, quarter note with a dot in line 2Ø.

+ or -

Transposes up or down by any number of half steps. This command does not alter the screen display, just the sound. Follow the + or - with a number between Ø and 3Ø. 12 is one octave, 24 is two octaves. To turn off the transpose, use + or - alone (or use a value of Ø).

You may offset just one voice by using two numbers: the first number is the number of the voice to offset (1-3).

1Ø +2Ø
2Ø -12
3Ø +
4Ø +1,12 (Raises Voice 1 12 half steps)
5Ø -3,1Ø

(I) INSTRUMENT

I voice,instrument

This command selects one of ninety-nine Music Processor instruments or presets for one of three voices. That voice uses that preset for the rest of the tune, unless "I" is used again for that voice. Voices may easily share the same instrument. The instrument selection sets the control register, the attack/decay, the sustain/release, whether that voice is filtered, and the vibrato.

Examples:

I1,3 (Voice l,Instrument3)
I2,2Ø (Voice2,Instrument2Ø)
I2,14
I3 , 1Ø

You may set all three voices to one instrument at once by just entering one number (the instrument number).

Examples:

1Ø I23
2Ø I12

You may turn a voice off by selecting instrument Ø.
Examples:
I2,Ø

(IN) INITIALIZE

This command resets the screen to The Music Processor staff. It also resets (or initializes) instrument presets 1 through 20.

On some songs you may wish to modify or create your own sounds using the M command. When you do this, use the presets 1 through 20. When you go to a new tune, and it has the IN at the beginning of data, any modifications you've made to 1 through 20 are reset to the original Music Processor presets.

If you modify presets 21 through 99 for a certain tune, they are not reset when choosing a new tune. In this case the new tune may not sound the way you like. You may restore those presets to normal by "PLAY"ing the file named START UP.

(K) KEY

K code

This command changes the key for your tune. If your tune is actually in a minor key, select the corresponding major key. The following table gives the list of keys available. The key of C flat is not a normally used key. The default key is C.

Notation	Key	Code
nothing	C	C
1 sharp	G	G
2 sharps	D	D
3 sharps	A	A
4 sharps	E	E
5 sharps	B	B
6 sharps	F sharp	F#
7 sharps	C sharp	C#
1 flat	F	F
2 flats	B flat	BF
3 flats	E flat	EF
4 flats	A flat	AF
5 flats	D flat	DF
6 flats	G flat	Gf
7 flats	C flat	CF

Examples:

KDF
K C
K F#

(L) LYRICS

L text

This command displays up to 40 characters per line at the bottom of the screen during play. The text has any leading spaces trimmed and is centered. This command may also be used to create a title for your song. Note: You should always have at least 1 space between the L and your lyrics.

Examples:

```
L ROW, ROW, ROW, YOUR BOAT
L «MINUET IN D »
L THE SILV'RY MOON!
```

This command waits for all three voices to finish before displaying the lyrics. If you just want to wait for one voice, then follow the L with the number of that voice.

```
10 L WELL HELLO, DOLLY
20 L1 YES, HELLO, DOLLY
```

!(WORDS)

You can place the ! (shifted1) in with your notes if you wish to highlight the individual words. It doesn't matter where in the note you place the !.

If you want to use the highlighting of the words, then separate the syllables with dashes (—), and use the ! in the notes where the words are to be highlighted.

```
10  GO MARCH-ING IN
20  C4Q!
30  E!
40  F!
50  GH!
```

If you use the left arrow (not CRSR) in the text, it will be treated like a normal character, only it will be seen as a blank during play. Doing this, several words are highlighted for the duration of one note.

(LE) LEGATO

LE voice
LE

Puts a selected voice into legato mode. The second format (without the voice number), puts all voices into legato mode. The term legato means to slur notes together, with no pause in between.

Examples:

LE 1
LE2
LE

(LI) LINK

LI link number,from,to
LI link number

This command links one memory location to another. That is, on 128th note intervals, it copies the byte from the "from" address to the "to" address. These addresses are in hexadecimal, may range for ØØØØ to FFFF, and must contain all 4 digits. If you leave off the ",from,to", then it turns off that link. You may have up to 4 links at once (link varies for 1 to 4).

This command is useful in creating special effects. For example, you might Link the output of envelope 3 (see page 75) with the pulse width register of Voice 1. The command for this is

LI1,D41C,D4Ø1

Examples:

LI 1,CØØF,DØ2Ø
LI 3,D41B,D4Ø1
LI 1

/ MEASURE

/(text)

This command waits for all 3 voices to finish what they are doing (not including slides). If the timing is done correctly, the measures have no effect. They can be used by timing certain special effects. You may also follow this with a comment text, which has no effect.

If you'd like to wait for only one voice, follow the / with the number of that voice.

Examples:

```
/
/ REPEAT
/ THIS MEASURE IS OPTIONAL
10 /1
20 /2
```

(M) MODIFY

M inst,ctl,atdec,susrl,vbr,vba,pw

Allows you to change an instrument's settings. If that instrument is currently selected for a voice, then that voice will be updated also.

inst: the value for **instrument** should be between 1 and 99.

The values for **ctl, atdec**, and **susrl** should be in hexadecimal and range from ØØ to FF (see page 67 if you don't understand this).

ctl: Sets the value for the SID control register. The exception to this is that bit Ø of this value determines the filter (Ø = off, 1 = on).

atdec: Sets the attack/decay.

susrl: Sets the sustain/release.

vbr: Sets the vibrato rate (in decimal).

vba: Sets the vibrato amount (in decimal). If you don't want any vibrato then set vbr and vba to Ø (see the Vibrato command in this section for more information on vibrato).

pw: Sets the pulse width for a pulse waveform. Values are 1 through 256 with the value 128 producing a square waveform. These values represent the most-significant eight bits of the twelve-bit pulse width registers in the SID chip.

If you do not wish to change a particular value, then leave that column blank (have two commas together).

Examples:

a cymbal-like sound
M 1,8Ø,Ø9,Ø9,4,5Ø,ØØ

the same thing only muffled
M1,81

like an organ
M 1,1Ø,ØØ,FØ,4,3Ø,ØØ

a more brilliant sound with no vibrato
M 1,4Ø,ØØ,FØ,Ø,Ø,128

sounds like it is played backwards
M 1,1Ø,AØ,ØØ,Ø,Ø,Ø

(NL) NON-LEGATO

NL voice
NL

Puts a selected voice into non-legato mode. The second format (without the voice number) puts all voices into non-legato mode. The term non-legato means to use the normal setting, and is used to cancel the legato and staccato modes. You may use the term NS instead of NL for documentation purposes, but NS does exactly the same thing.

Examples:

NL 1
NL2
NL
NS 3

(P) POKE

P start,data,data,...

This command allows you to store any data directly into the computer's memory. It also allows you to create your own binary programs that run with The Music Processor, or to control other parts of your C-64 computer. The start value is the location in memory where it starts storing the data, and must be 4 hexadecimal digits. The following data (as many as you can fit on a line) are also in hexadecimal. This command should be used with caution, as it can cause The Music Processor to "crash".

Examples:

PD415,ØØ,Ø1
PD418,2F
PD41Ø,Ø,8

(PR) PRESET

Change a preset, to a new instrument. PRn,m.

n is 1 through 9 for the individual presets, m is Ø through 99 for the instrument.

1Ø PR1,2Ø
2Ø PR2,44
3Ø PR3,78

When The Music Processor is first booted-up, presets 91 - 99 are the default settings in the preset display. Preprogrammed songs on The Music Processor disk contain PR music commands in the data which cancel the default settings and display new preset numbers. If you'd like to change any preset in a song, simply change the instrument number in any PR data line.

(RHY) RHYTHM

For making a rhythm. This command allows you to set up a sequence of instruments, The Music Processor cycles through, changing the instrument on the beat. Due to hardware limitations, the attack,decay,sustain,release (ADSR) changes only when a note starts (although the sequence and timing are not affected).

Start with RHY, followed by the voice to put the rhythm on, comma, the duration of the beat (W,H,Q,E,S, or T), comma, and then the instruments, in order, separated by commas, up to 2Ø. The rhythms of the 3 voices are entirely independent from each other.

1Ø RHY1,Q,2,1,3,1

RHY alone turns off all rhythms.

1Ø RHY

RHY followed by 1, 2, or 3 will turn off rhythm in that voice

1Ø RHY 1

If you omit the 1, 2, or 3 before the duration (W,H,Q...) the rhythm applies for all 3 voices.

1Ø RHYQ,4,1,1

(S) SID

S register,data

This command is used to alter the settings of the SID (Sound Interface Device) chip. The register and data should both be in hexadecimal. The register value ranges from ØØ to 18, and selects which register is to be altered. The S command also updates the SID register image contained in RAM at locations ØEØØ to ØE18. See page 65 for more information.

Examples:

S Ø2,ØØ
SØ3,Ø1

(SF) SLIDE FILTER

SF mode,res,start,count,rate
SF mode,res,start

This command slides the filter cut off frequency, while allowing the voices to play simultaneously. Remember, the filter affects only those voices selected for filter (see the M modify command). Mode determines the mode the filter is set to (see the chart on MODE/VOL on page 74. Res (see the format above) determines how sharply the filter cuts off the frequencies, where Ø is the least sharp and 15 is the sharpest. Start is the beginning setting and should vary between Ø and 65535 (Ø is the same as 65536). Count is the number of steps to slide in 128th notes. Rate determines how much is added each step. You may "slide down" if you put a minus sign in front of the rate. When a note is played using an instrument which uses the filter, the Slide Filter is restarted. If you don't want this to happen, all a **,1** to the end of the Slide Filter command. If you leave off the ",count,rate", this command just sets the filter to the specified values.

Examples:

SF 1,15,Ø,Ø,1ØØ
SF 2,15,Ø,128,16,1
SF 4,8,Ø,Ø,-64
SF 5,15,1ØØØ
SF 2,15,15Ø

(SL) SLIDE

SL voice,start,count,rate
SL voice
SL

This command slides the selected voice, while allowing the other voices to play simultaneously. A slide is like the slide on a trombone, sliding from one pitch to another. You may slide any or all of the voices, independently of each other. Voice selects which voice to use, and varies between 1 and 3. Start is the beginning pitch and should vary between Ø and 65535. Count is the number of steps to slide (at 128th note intervals) and may vary between Ø and 65535. A value of Ø causes sliding until explicitly stopped. Rate determines how much is added each step. You may "slide down" if you put a minus sign in front of the rate. SL with a voice number alone will turn off that slide immediately, and SL alone will turn off any existing slide.

Examples:

SL 1,Ø,Ø,256
SL 2,Ø,128,512
SL 1,-1,Ø,-4
SL

(ST) STACCATO

ST voice
ST

Puts a selected voice into staccato mode. The second format (without the voice number), puts all voices into staccato mode.

The term staccato means to play a note very briefly, with a long pause afterword.

Examples:

ST3
ST 1
ST

(T) TEMPO

T speed

Selects the tempo or speed of the piece. The value for speed may vary between Ø and 9. Ø is the slowest, 9 is the fastest, and 4 is nominal. These are inserted as data lines in your song.

Examples:

```
T5
T Ø
T9
```

Also, if you use a tempo value between (and including) 3Ø and 1ØØØ, The Music Processor uses that value in quarter notes per minute. The T command does not wait for the voices to finish before executing.

```
1Ø T5
2Ø T12Ø
3Ø T4ØØ
```

While a song plays, you can control the tempo as follows:

F key: Fast Forward causes song to speed up (press F key again to exit)

- key: Increases tempo slightly each time it's pressed

+ key: Decreases tempo each time it's pressed

(V) VOLUME

V volume
V voice,sustain

This command actually has two forms. The first form allows you to select the total volume of the tune. The value for volume may range from 1 to 16. The second version allows you to change the sustain level of a particular voice. The sustain level may vary between 1 and 16. Due to Commodore hardware, changing the overall volume causes a slight "click". The second version can change the effective volume of a voice, but may also affect the sound quality of that voice.

Examples:

```
V5
V 1,6
```

(VI) VIBRATO

VI voice,rate,amount
VI voice

Turns on the vibrato for the selected voice. This causes the pitch to alternate between the normal pitch + amount, and the normal pitch– amount. This switch occurs at the rate of every 128th note segment times the rate. Rate can vary between 1 and 256: the higher the number, the slower the rate. Amount can vary between Ø and 255: the higher the number, the stronger the vibrato. Rate should normally range between 1 and 4, and amount should normally range between 2Ø and 1ØØ. If the rate and amount are left off, then vibrato is turned off for that voice. If you use the I command to change the instrument, the voice takes on the vibrato setting of the selected instrument.

Examples:

VI 1,2,5Ø
VI 2,1,255
VI 3,12,255
VI 2

(X) EXTRA

X select,data,data...

This command has no specific function, but rather allows the advanced user to interface to his own programs. The select value should vary between 1 and 8 and selects which of the user programs to execute. The value of the data is in decimal and may vary between Ø and 65535. Up to 7 values (data) may be given to the user program. The program is normally poked into memory using the P command. The default setting X1 clears the screen. X1,"text" prints that text on screen. Refer to page 78 to Poke screen action off.

Examples:

X 1,1ØØØ,5,4Ø
X3,Ø,Ø,2,4,7,1ØØ,29ØØØ

; COMMENT

;text

This command allows you to include documentation in your tune data. Comments are not displayed while song is playing.

```
; THIS IS WHERE THE STACCATO STARTS
;
; BY M. PETER ENGELBRITE
```

INPUTTING MUSIC NOTATION

NOTES AND VOICES

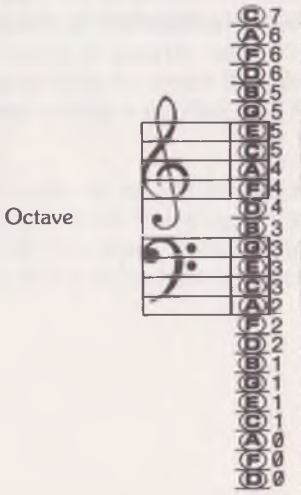
The C-64 has three music synthesizers or voices. When we use the term voice, we are referring to one of three physical devices which make sound. The voices are numbered 1, 2, and 3. They are pretty much independant from each other.

At the beginning of a tune, usually two large numbers appear(2/4, 3/4, 4/4 etc.). The top number represents how many notes there usually are per measure, and the bottom number tells how long those notes are. A 2 over a 4 means that there are 2 quarter notes per measure. This notation is not used at all by The Music Processor, but helps you understand the timing of the tune.

Tunes may often have more than 3 voices, in which case you must simplify the tune. It is usually best to take the top and bottom notes of the treble (upper) clef, and the bottom note from the bass (lower) Clef, but there are no hard and fast rules as to which notes to use.

Notes are played by data entered after a line number. To activate Voice 1, start with the name of the note (A, B, C, D, E, F, or G). Follow this with the modifiers which set the octave, length, etc. The modifiers may be in any order and are shown on the next page.

MODIFIER (LENGTH)	TYPES OF NOTES	RESTS (R)
W	Whole Note	
H	Half Note	
Q	Quarter Note	
E	Eighth Note	
S	Sixteenth Note	
T	Thirty-second Note	
.	Dotted Note (increases duration by 1/2)	



MODIFIER (OCTAVE)

Ø,1,2,3,4,5,6,7 Octave

To play a middle C whole note on Voice 1 you enter:

```
1Ø  C4W
```

To activate Voice 2, follow Voice 1 with a comma and the note and modifiers for Voice 2:

```
1Ø  C4W,E4W,
```

To activate Voice 3, follow Voice 2 with a comma and the note and modifiers for Voice 3:

```
1Ø  C4W,E4W,G4W
```

In other words, you create 3 "columns" separated by commas, one column for each voice.

These columns may be left blank if you wish the voice not to be activited. To play just Voice 3, use:

```
1Ø, , G4W
```

To play Voice 1 and 3 use:

```
1Ø C4W, , G4W
```

To play Voice 1 and 2, you need not follow Voice 2 with a comma:

```
1Ø C4W, E4W
```

To play a rest, substitute the name of the note with an R. The rest occurs on the voice selected by the column.

Examples:

```
RW
, , RW
RE,RQ,RW
```

Now for a very important point: When The Music Processor plays a line, it just starts the voices playing, then goes on to the next line. Also, The Music Processor waits for any previously playing voices to finish, before starting the next note. This is not true of skipped or empty columns.

When translating from sheet music, one line of The Music Processor is equivalent to one column of sheet music. If the Notes on the page are right above each other, they should be on the same line in The Music Processor. In music, very often notes will start or stop while another note is still playing. In order to correctly enter tunes (especially in more advanced pieces) you need to understand when each note starts and stops, before you enter it. The Music Processor allows you to create this timing with "empty" columns. If a column is empty, and that voice was already playing a note, Then it will continue playing until a new note appears in that column.

Example:

To play a half note in voice 1 while playing two quarter notes in Voice 2

```
C4H,C4Q
,C4Q
```

The half note from the first line will still be playing when the second line starts its quarter note. The second line will wait for the quarter note on voice 2 to finish, but will ignore what is happening on voice number 1. This function is true for rests also.

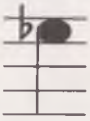
Note: Be sure to refer to the MERGE command. This allows you to type in each Voice separately. When MERGE is used, The Music Processor does all the calculating and allows each note to be turned on at precisely the right time.

SHARPS, FLATS, AND NATURALS

(#) Sharp

Example: C#

(F) Flat

Example: E F

(N) Natural

Example: A N

The accidentals (Sharp, Flat, and Natural) must be done for every note, even though music notation calls for the accidentals to continue through the measure. For instance, if you see a note with a sharp, you must sharp every note on the same line for the rest of the measure (until the vertical line).

If you leave off the octave or the duration, then The Music Processor retains the octave and duration of the previous note, regardless of which voice is used. However, dotted notes (a dot to the right of the note) must be entered for each note.

Examples:

C4Q,D,F
D5H,EQ,FS
D,E,F

STACCATO, TIES, AND LEGATO

(*) Staccato

CQ*

(=) Legato

10 FQ =
20 AQ

(-) Tie

Example: 10 Q-
20 Q

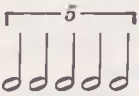
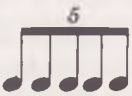
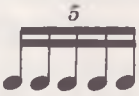
You may cause a note to be STACCATO with the * character. The music notation for this is a dot under or over the note, and makes the note play very breifly, with a long pause after (although the overall timing remains normal).

You may TIE a note to the next with a – (minus sign) character. This allows you to combine two notes into one, for very long notes. This is normally shown as a curved line between the notes.

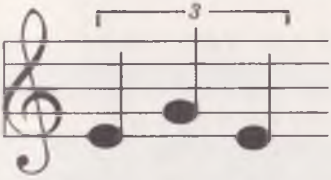
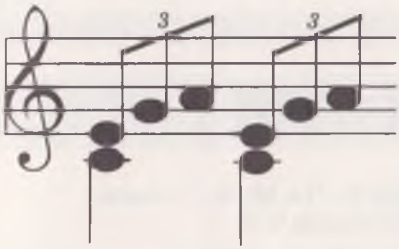
You can get a SLUR (legato) with the = sign. This causes the note to play for the full duration, with no pause following. It is different from the tie in that it actually starts the new note, rather than combining them into one note. Music notation for a slur uses the same curved line as in the tie, but is usually between two or more notes of different pitch.

TRIPLETS

Sometimes in music notation, you'll see a group of notes with a number over them. If the number is a 3, this is called a TRIPLET. That means that 3 notes are to be played in the same time as two notes. You may do this by using the bracket ([x,x]) notation. Remember, if you have other voices being turned on at the same time, you have to calculate the sequence in which the voices are started. The following chart gives the times for several of the "groups" and their overall lengths.

H	Q	E	S
[34,9]	[18,4]	[8,3]	[4,2]
[34,9]	[17,4]	[8,3]	[3,2]
[33,9]	[17,4]	[7,3]	[3,2]
			
[20,6]	[9,4]	[5,2]	[3,1]
[20,6]	[9,4]	[5,2]	[2,1]
[20,6]	[9,4]	[4,2]	[2,1]
[19,6]	[9,4]	[4,2]	[2,1]
[19,6]	[8,4]	[4,2]	[2,1]

To display the correct appearance of a note in the above groups, type the note-type before the left bracket.

Examples:

```
10 E4Q[18,4]
20 G4Q[17,4]
30 E4Q[17,4]
```

```
10 C4Q ,E4E[8,3]
20     ,G4E[8,3]
30     ,A4E[7,3]
40 C4Q ,E4E[8,3]
50     ,G4E[8,3]
60     ,A4E[7,3]
```

You may create oddball timing by using the square brackets ([ ]). Start with the left square bracket ([ ). Then the length of time that the note is to be on (sustain), in 128th note increments. This number may vary between Ø and 255. Then a comma. Then the length of time that the note is to be silent, in 128th note increments. This number may vary between Ø and 255. The silent time is actually the restore period and some instrument selections may make sound during this time.

Examples:

(64th note)
C4[1,1]

(very staccato whole note)
C4[1,127]

(very legato whole note)
C4[127,1]

It should be noted this notation overrides the normal staccato control. This timing is not retained in following notes, but must be entered for each note.

PLAN FOR INPUTTING A SONG

Here are some guidelines and tips for inputting a song. These are basic and after working with The Music Processor for a while you'll develop a few "tricks" yourself.

WHICH WAY TO INPUT

Of the various options available in The Music Processor, the one you'll probably find the handiest is:

Option 1: Input in the STEP mode. Here you can use either your joystick or the CRSR controls to manipulate the notes. This mode saves you typing because it automatically enters pitch, duration, and octave. All you do is add sharps, flats, naturals, or other data such as ties or dots.

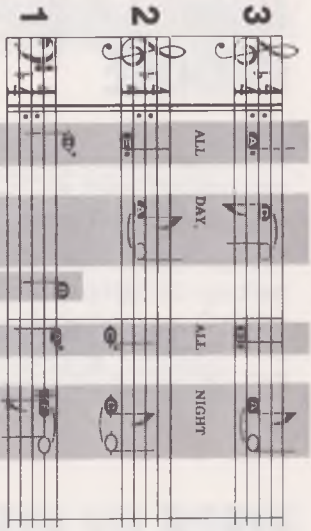
In the STEP mode you have two choices:

1. Input one voice at a time and use the MERGE command to combine them. In this case The Music Processor does all the time calculations and places each tone correctly.

2. Inputting all three voices at one time. This requires you to view a piece of music "vertically". Each column of notes on the music becomes a line of data in The Music Processor.

```
120    L3 ALL DAY, ALL NIGHT
130    C4H.,F4Q.,A4Q.!

140          ,AE-,C5E-!
150          ,AH ,CH
160    B3Q
170/2
180    AQ.,CQ.,F4Q.!

190    F# E-,CE-,AE-!
200    F# H ,CH ,AH
```

Option 2: Real Time Input. Use the RECORD Mode to play each voice. When you've recorded all 3 voices, use the MERGE function to combine them into the complete arrangement.

WHICH NOTES DO YOU CHOOSE

If you are inputting from sheet music, or something similar, you must fill each of The Music Processor voices with notes that sound good.

In most cases, the lowest notes are put in Voice 1. The melody, or high part is placed in Voice 3. Notes placed in Voice 2 can be any of the remaining notes which sound good to you. This may take some experimentation on your part, but with a little practice you'll be a great arranger.

PIECE BY PIECE

If the selection you're inputting is a long one, it's a good idea to divide it into sections. Input each section and when each is just the way you want it, file it on disk. When all the sections are completed, use the APPEND command to tie them all together. This prevents your losing hours of typing because of something accidental.

MEASURE MARKS MARK THE TRAIL

Before beginning input, it's a good idea to number the measures of your selections - maybe not each measure, but at least every fourth one. As you input, if you show these measure numbers in your data, (/1, /2, etc.), you'll always know where to go to make corrections or additions.

If you are inputting one voice at a time with plans to MERGE these files later, you'll find the measure marks even handier. If measure marks were used in each voice, when Merged they should appear together:

```
20/3
30/3
40/3
```

If they don't, you probably have a typing or music error in the preceding data.

Once you've got the entire selection correctly input, you can go back into the data and remove the measure marks if you desire:

Type the line number then press RETURN. Doing this saves both memory and disk space.

SHORTHAND

Remember The Music Processor SHORTHAND. In a voice, you don't have to repeat OCTAVE or DURATION if it remains the same as a previous note:

This	becomes	This
C4Q		C4Q
D4Q		D
E4Q		E
F4E		FE
G4E		G
A4E		A
B4E		B

Saves typing, doesn't it?

REPEAT SIGNS

Many musical arrangements require certain sections, or even the entire song, to be played twice. Instead of reprinting these sections, musical symbols called repeat signs are used to indicate the section to be replayed.

Repeat signs appear most often in sets of two . . .one sign at the beginning of the section to be repeated, and one at the end. This is shown in Figure A.

When you come to the second repeat sign, go back to the first and repeat all of the measures between the two signs.

FIGURE A

Occasionally you'll find only one repeat sign at the end of a section or a song, as shown in Figure B. Play to the sign, go back to the beginning of the song and play that section again. If there is more music after the repeat sign, just keep playing.

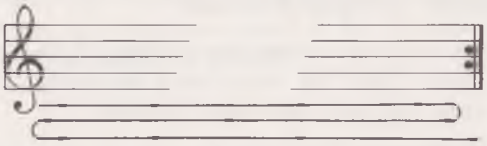


FIGURE B

A song may also contain more than one set of repeat signs, as shown in Figure C.

When this occurs, play twice through all of the measures within the first set of repeat signs. Then, all of the measures within the second set should be played twice. In each case, always go back to the closest repeat sign.

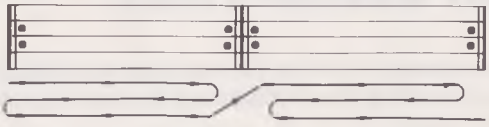


FIGURE C

Some songs contain repeat signs in conjunction with another musical symbol, the double ending, as shown in Figure D.

When you play the song the first time, play the measure marked by the bracket with the number 1, the first ending. Play up to the repeat sign and return to the repeat sign at the beginning. After playing the song a second time, skip the first ending (1) and play the measures marked by the bracket with the number 2, the second ending.

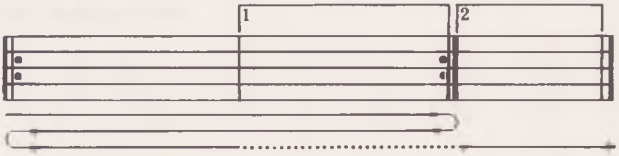


FIGURE D

REPEATS ARE A BREEZE

In any portion of a song that repeats or is the same as another, the APPEND and SAVE features can make your inputting easier. To repeat a section:

1. Type S filename,line number,line number. A short file name like "work 1" or "A1" is all that's necessary. This saves the portion of song you want to repeat.

2. Type APP filename. This attaches the file from disk right to the end of whatever is in the computer work area.

WHICH COMES FIRST

In most situations, inputting the music completely first, then the lyrics, then the highlighting (!), seem like a good work plan.

THE SID CHIP

This chapter contains technical information on the Commodore SID (Sound Interface Device) integrated circuit. More information is given in the Commodore 64 Programmer's Reference Guide.

INTRODUCTION

The SID chip contains 3 separate sound synthesizers (voices), a filter system, and some special features. You control the SID by storing values into SID registers. These registers act a lot like normal C-64 RAM locations. However, your values are not stored in memory (RAM), but rather are stored in the SID chip itself, and control the SID.

Each voice allows you to select one of 5 waveforms for that voice: Triangle (mello), Sawtooth (raspy), Pulse (brilliant), Combination (thin), and Noise (shush, or crash).

The SID also allows you to define the ADSR envelope (Attack/Decay/Sustain/Release) for each voice. The ADSR envelope determines how the volume of a note changes with time. The note starts out at Ø volume. It then gradually increases to maximum volume. The rate of increase is determined by the Attack value. It then gradually declines, with the rate determined by the Decay Value. This continues until it reaches the Sustain level. The length of time it remains at the Sustain level is determined by The Music Processor (or the GATE bit in the SID). Then it decreases to Ø volume, and that rate is determined by the Release rate.

The filtering system operates on the sounds from the individual voices, after they are produced. It allows you to selectively filter out certain frequencies of sound. Although the controls for the filter system are common to all three voices, you may individually choose whether a voice is to be filtered at all.

Important note: If you'd like to know more about synthesizers and how they work, inquire about a tutorial program called 3001 SOUND ODYSSEY. This program is available from your dealer or Sight & Sound Music Software, Inc.

THE SID REGISTERS

The SID contains 3 nearly identical synthesizer (voice) circuits. Each voice has 7 registers. These registers appear as memory, at the locations shown on page 79. Since all of these registers (except for two of them) are write-only, The Music Processor maintains an image of the registers in normal RAM.

A WORD ON HEXADECIMAL

Hexadecimal is an alternate number system used in computers, and means "base 16". It is often abbreviated as "Hex". It uses the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 like normal numbers (decimal - base 10), but also uses the letters A, B, C, D, E, F to represent the decimal values 10, 11, 12, 13, 14, 15. You don't need to understand hexadecimal, because we have included charts to allow you to just "plug in" the correct value. However, here is a chart to convert hexadecimal to decimal and binary (another number system - base 2):

Hex	Decimal	Binary
0	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000
9	9	1001
A	10	1010
B	11	1011
C	12	1100
D	13	1101
E	14	1110
F	15	1111

FREQ LO/FREQ HI

This is what sets the pitch of the note. This is 16 bits of data, and is divided into two 8-bit registers. This data is equal to the frequency times 16.404425.

PW LO/PW HI

This determines the width of the pulse waveform (this has an effect only if the pulse waveform is selected). The lower 8 bits are in PW LO, and the upper 4 bits are in PW HI (the upper 4 bits of PW HI are not used). The value to store here is equal to the desired pulse width (expressed in % of the entire wave) times 40.95.

CONTROL REGISTER

The individual features are described below, and a chart is given of useful combinations of these features in hexadecimal (hex), when set by the CNTL parameter of the M(Modify Instrument) command (see page 42). It should be noted that bit 0 has a different meaning for the M modify instrument command.

GATE (bit 0)

This is what starts the attack/decay sequence. The time of the sustain is primarily determined by how long this bit is set.

SYNC (bit 1)

This causes voice 1 to be synchronized with voice 3, and can produce some strange sound effects.

RING MOD (bit 2)

Causes ring modulation with voice 3. This only works if you select the triangle (1) waveform for voice number 1. This is also used for special effects.

TEST (bit 3)

Locks up voice number 1. Not very useful.

RING, SYNC, and FILTERS

Lower nibble (right hand hex digit)

SID	M Inst.	Description
Ø		Turn off voice
1	Ø	Turn on voice
3	2	SYNC
5	4	RING MOD
7	6	RING MOD & SYNC
	1	Filter
	3	SYNC & Filter
	5	RING MOD & Filter
	7	RING MOD & SYNC & Filter

Upper nibble (left hand hex digit)

1 Triangle waveform
2 Sawtooth waveform
4 Pulse waveform
5 Combination waveform
8 Noise waveform

ATTACK/DECAY

The upper nibble (left hand hex digit) selects the attack rate.

ATTACK

Value	Time (seconds)
Ø	.ØØ2
1	.Ø08
2	.Ø16
3	.Ø24
4	.Ø38
5	.Ø56
6	.Ø68
7	.Ø8Ø
8	.1Ø
9	.25
A	.5Ø
B	.8Ø
C	1.Ø
D	3.Ø
E	5.Ø
F	8.Ø

The lower nibble (right hand hex digit) determines the decay rate.

DECAY

Value	Time (seconds)
Ø	.ØØ6
1	.Ø24
2	.Ø48
3	.Ø72
4	.114
5	.168
6	.2Ø4
7	.24
8	.3Ø
9	.75
A	1.5
B	2.4
C	3.Ø
D	9.Ø
E	15.
F	24.

SUSTAIN/RELEASE

The upper nibble (left hand hex digit) controls the sustain level for the note, and may vary from Ø to F. The sustain time is controlled by turning the GATE (bit Ø of the control register) on and off.

The lower nibble (right hand hex digit) controls the release rate.

Value	Time (seconds)
Ø	.ØØ6
1	.Ø24
2	.Ø48
3	.Ø72
4	.114
5	.168
6	.2Ø4
7	.24
8	.3Ø
9	.75
A	1.5
B	2.4
C	3.Ø
D	9.Ø
E	15.
F	24.

VOICE 2

Voice 2 is the same as voice 1, except the SYNC and RING MOD link voice 2 with voice 1.

VOICE 3

Voice 3 is the same as voice 1, except the SYNC and RING MOD link voice 3 with voice 2.

FC LO/FC HI

This controls the cutoff frequency for the filter. The frequency may vary from 30 Hz. to 12 KHz. and is expressed in an 11 bit number. The lower 3 bits are contained in bits 0-2 of FC LO, and the high 8 bits are contined in FC HI. This means if you don't need fine control, you can just use FC HI. This register affects all voices that have the filter on.

RES/FILT

The high nibble (left hand hex digit) controls the resonance of the filter. This controls how sharply the filter cuts off frequencies. The low nibble (right hand hex digit) controls which voices are to be filtered. There is also an external audio pin, which allows you to feed external signals into the SID chip for filtering. (See the Commodore 64 Programmers Reference Guide for further details).

Value	Voice 1 Filter	Voice 2 Filter	Voice 3 Filter
Ø	off	off	off
1	on	off	off
2	off	on	off
3	on	on	off
4	off	off	on
5	on	off	on
6	off	on	on
7	on	on	on

MODE/VOL

The high nibble (left hand hex digit) controls the filter. It also allows you to turn the voice 3 output off. In order to use voice 3 for certain special effects. **High pass** means the sounds of higher pitch than the filter frequency are audible. **Band pass** means that sounds that are about the same as the filter frequency are heard. **Low pass** means that sounds of lower pitch than the filter cutoff frequency can be heard.

Value	Destription
1	Low pass
2	Band pass
4	High pass
5	Band reject
9	Low pass, Voice 3 off
A	Band pass, Voice 3 off
C	High pass, Voice 3 off
D	Band reject, Voice 3 off

The low nibble (right hand hex digit) selects the overall volume, and varies from Ø to F.

OSC 3

This register contains the output of the waveform from voice 3, as it is produced. This and ENV 3 are the only registers that can be read. It will vary for Ø to FF. This is very useful for special effects by using the X4 link command.

ENV 3

This register is similar to OSC 3, except that it contains the output of the envelope from voice 3, rather than the waveform.

SID MEMORY LOCATIONS

	Register Number	SID Address	Image Address
Voice 1			
FREQ LO	00	D400	0E00
FREQ HI	01	D401	0E01
PW LO	02	D402	0E02
PW HI	03	D403	0E03
CONTROL	04	D404	0E04
ATT/DEC	05	D405	0E05
SUS/REL	06	D406	0E06
Voice 2			
FREQ LO	07	D407	0E07
FREQ HI	08	D408	0E08
PW LO	09	D409	0E09
PW HI	0A	D40A	0E0A
CONTROL	0B	D40B	0E0B
ATT/DEC	0C	D40C	0E0C
SUS/REL	0D	D40D	0E0D
Voice 3			
FREQ LO	0E	D40E	0E0E
FREQ HI	0F	D40F	0E0F
PW LO	10	D410	0E10
PW HI	11	D411	0E11
CONTROL	12	D412	0E12
ATT/DEC	13	D413	0E13
SUS/REL	14	D414	0E14
FC LO	15	D415	0E15
FC HI	16	D416	0E16
RES/FILT	17	D417	0E17
MODE/VOL	18	D418	0E18
OSC 3	1B	D41B	
ENV 3	1C	D41C	

MEMORY LOCATIONS

DDØ4 : Tempo control (low byte)
DDØ5 : Tempo control (high byte)
Ø812 : Ø : Old shorthand format
Ø813 : Ø : Screen action off
Ø814 : B : Clef color
Ø815 : E : Lyrics color (top line)
Ø816 : F : Lyrics color (bottom line)
Ø817 : 2 : Lyrics highlight color
Ø818 : A : Voice 1 note color
Ø819 : 5 : Voice 2 note color
Ø81A : E : Voice 3 note color
Ø81B : 1 : Background color
Ø81C : 5 : Border color

		LOW	HIGH
X1	VECTOR	ØE20	ØE21
X2	VECTOR	ØE22	ØE23
X3	VECTOR	ØE24	ØE25
X4	VECTOR	ØE26	ØE27
X5	VECTOR	ØE28	ØE29
X6	VECTOR	ØE2A	ØE2B
X7	VECTOR	ØE2C	ØE2D
X8	VECTOR	ØE2E	ØE2F

In the preceding chart, some locations have their default settings listed: these locations are re-initialized at the beginning of playing a tune. **Screen action off** turns off the display of the notes and key (set to 1 to activate). The **color locations** Ø814-081C should be set, then the IN instruction used. The clear screen may be used with X1 (the default location of the X1 command is the screen clear), no parameters are needed.

JOYSTICK SPECIAL EFFECTS TECHNICAL DATA

The following chart is of the commands used by the joystick special effects:

#1
LI1,ØØA2,D4Ø5
LI2,ØØA2,D4ØC
LI3,ØØA2,D4ØD
LI4,ØØA2,D414

#2
SF4,15,Ø,Ø,128
PD417,F7
PØE17,F7

#3
SF2,15,Ø,Ø,—4Ø
PD417,F7
PØE17,F7
SL1,Ø,Ø,—8Ø
SL2,Ø,Ø,55
SL3,Ø,Ø,1430

#4
LI1,D41C,D4Ø1
LI2,D41B,D4Ø8

#5
SF2,15,Ø,Ø,—16
PD417,F7
PØE17,F7

#6
SF1,15,Ø,Ø,128
PD417,F7
PØE17,F7

#7
VI1,4,1ØØ
VI2,4,1ØØ
VI3,4,1ØØ

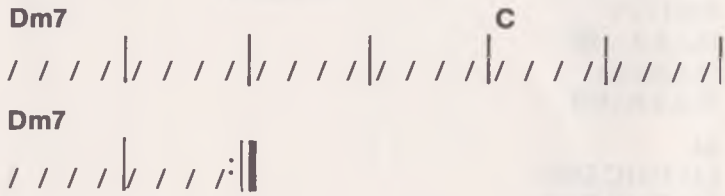
#8
SL1,Ø,Ø,8
SL2,Ø,Ø,8
SL3,Ø,Ø,8

#9
SL1,Ø,Ø,—64
SL2,Ø,Ø,64
SL3,Ø,Ø,56Ø

THE MUSIC PROCESSOR ACCOMPANIMENT CHORD PROGRESSIONS (See Piano)

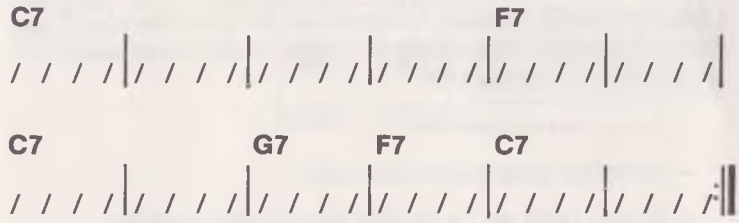
NORMAL

DISCO

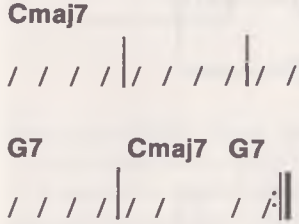


ROCK

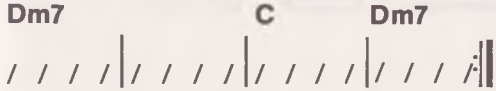
ROCK 'N' ROLL



SAMBA



REGGAE



CONNECTING TO YOUR STEREO

Using the audio on your Commodore 64, you can play The Music Processor through many types of electronic sound equipment. These include:

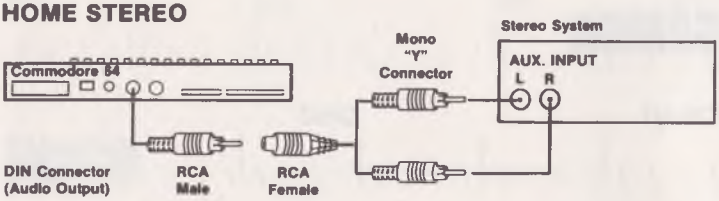
— home stereo systems

— portable, personal stereo units

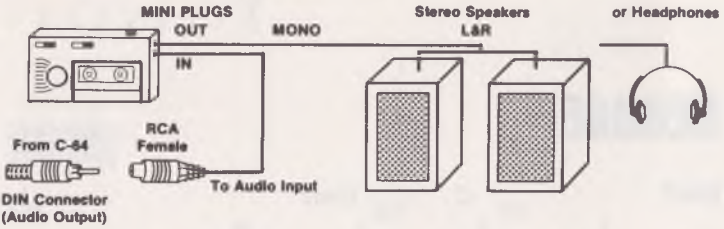
— effects units and a musical instrument amplifier

— or simply, a set of headphones.

HOME STEREO

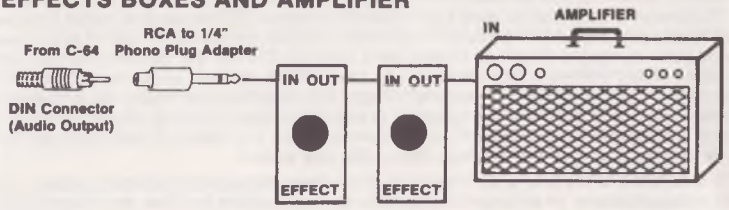


PERSONAL STEREO

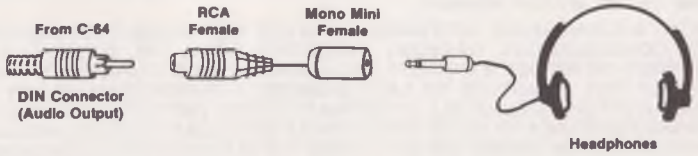


Note: Using this arrangement, you can play along with the radio or tape.

EFFECTS BOXES AND AMPLIFIER



HEADPHONES



Important Note: Since the audio output level of the Commodore 64 is fairly high, use caution when connecting it to sensitive sound equipment. The following precautions should prevent any problems:

1) Turn volume controls all the way down before turning on any equipment. Then turn up the volume slowly once the equipment is turned on.

2) If distortion occurs at normal listening levels, turn off the system and consult your audio dealer before any further use.

LIMITED WARRANTY

Sight & Sound Music Software, Inc. warrants, to the original consumer purchaser (the "Purchaser") only, this product against defects in material and workmanship for a period of ninety (90) days from the date of purchase. (Be certain to obtain a bill of sale — keep it and your cancelled check or charge card receipt.) During the warranty period, Sight & Sound Music Software, Inc. will repair or, at its option, replace, at no charge, this product provided that the product is returned to Sight & Sound Music Software, Inc. at the address shown below. In the event replacement is elected by Sight & Sound Music Software, Inc., any replacement product shall be warranted under the terms of this warranty for the remainder, if any, of the original ninety (90) day period.

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*If the Product being returned is a diskette, it must have the original Sight & Sound Music Software, Inc. manufactured label affixed. Sight & Sound Music Software, Inc. will not accept any diskette with a facsimile label attached.

SIGHT & SOUND Music Software, Inc.

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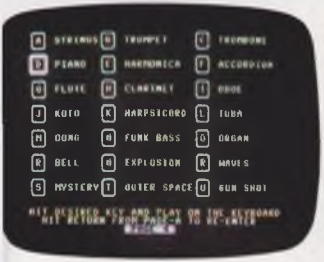

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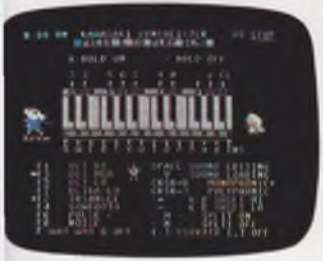

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*See the MUSIC PROCESSOR on page 6.

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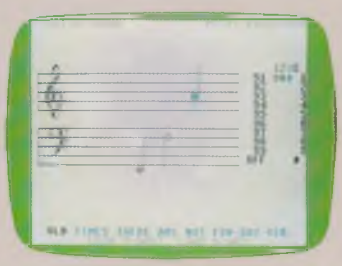
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